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surgical colleagues and fellow scientists knew, admired and loved.  
G. W. CRILE  
CLEVELAND, OHIO

*Societal Evolution: A Study of the Evolutionary Basis of the Science of Society.* By ALBERT GALLOWAY KELLER, professor of the Science of Society in Yale University. New York, The Macmillan Co., 1915. Pp. 330. \$1.50.

Some years ago when he was professor of political and social science in Yale University, William Graham Sumner introduced the term "societal" into sociological terminology. His purpose was to employ a word more definite than "social" in order to emphasize the distinctively collective or group activities of individuals. "Social," he thought, had too many meanings to be exact. Following this usage, Sumner included in his remarkable book, "Folkways," an interesting chapter on what he termed "societal selection." In most concrete fashion did he therein show how by group or "societal" action, various "folkways" and "mores," as he termed them (*i. e.*, customs), whose origin is often obscure, are more or less consciously and intelligently chosen or "selected" by the group, become authoritative and finally compel conformity.

Professor Keller, modestly characterizing the present volume "as an extension of Sumner's work," employs "societal" in his title and in the main accepts Sumner's conceptions as a basis for his own contributions. The extension consists essentially in an endeavor to show both that there is "societal" evolution and that the manner in which such evolution occurs can advantageously be stated in terms employed by Charles Darwin in the biological field. To use Professor Keller's own language: "The question I have asked myself is: can the evolutionary theory, according to Darwin and his followers . . ., be carried over into the social domain without losing all or much of the significance it possesses as applied in the field of natural science?" He expressly denies that the eugenists in their attempts to prove the effectiveness of natural selection in human society have really attacked this gen-

eral issue. Professor Keller considers that natural selection is a term which in a very literal sense can and ought to be applied in the theory of social evolution not only with a strictly biological meaning, but also with a social, or, shall we say, "societal" meaning? He finds "a something in the social field which *is* variation, whether or not it may be like what is called variation in the organic field; similarly, social selection *is* selection and not merely *like* it." This "something" appears to be the differences among those customs which Sumner called folkways and mores. In conformity with this conception there are chapters on "variation," "automatic and rational selection," "counter selection," "transmission" and "adaptation." In these chapters occur many interesting instances of transformations in customs interpreted as illustrations of the processes just named.

The author vigorously defends his application of these Darwinian terms to social phenomena. "I shall be charged, doubtless," he says, "'with reasoning from analogy,' but I do not feel that the charge is deserved." To the present reviewer, however, there is a question raised by the use Professor Keller makes of these terms and the manner in which he deals with certain parts of his material, far more important than a possible "reasoning by analogy" of which he seems apprehensive. "Reasoning by analogy" is perfectly legitimate if thereby the reasoner develops a hypothesis that is capable of independent proof. Thus the known refrangibility of light and heat, Spencer tells us, produced the inquiry as to whether sound is not also refrangible. On investigation this proved to be the case. The analogy led to discovery. If in the present instance valuable discoveries had resulted from a use of an analogy, no one could have objected. Such, however, does not appear to be the fact. Many, if not practically all, of the important actual social processes emphasized by Professor Keller have been clearly discussed at one time or another by various sociological writers without unnecessary resort to biological phraseology. Even Walter Bagehot in "Physics and Politics," which he subtitled

"Thoughts on the Application of the Principles of 'Natural Selection' and 'Inheritance' to Political Society" did not particularly stress the importance of the biological terms he at times employed. Although in one passage Bagehot refers to natural selection among animals and in human history as "identical in essence," he nevertheless in the very next paragraph remarks concerning his use of the term: "At all events to the sort of application here made of it [*i. e.*, in 'Physics and Politics'], which only amounts to searching out and following up an analogy suggested by it, there is plainly no objection." Bagehot points out, as does Keller, the fact that differences in customs affect the efficiency of rival groups and may thereby indirectly affect the chances of survival possessed by their observers. Bagehot went on, as does Keller also, to treat in a very broad way the relation of custom, of unconscious imitation, of reason and of many other factors to the survival and progress of groups and nations. Bagehot did this, however, without at all falling into the confusion necessarily produced by ignoring or rather obliterating by a *tour de force* the plain distinction between natural selection in the strict Darwinian sense and the same term loosely used for natural conscious or unconscious social choices. Transference of biological terms into the sociological field and use of them in the literal fashion employed by Professor Keller does not offend so seriously in "reasoning by analogy" as it does in what seems to the reviewer a misleading and scientifically illegitimate use of precise biological terms. There is no need to repeat in a somewhat different form the sort of thing which followed Spencer's application of the term organism to society.

The foregoing criticism, however, is very largely one of terminology and the careful reader will find much of great value in Professor Keller's book. The differences among customs, the ways in which various customs have originated, the effects of conscious and unconscious imitation, the relation of suggestion, of conflict and of reason to the development of specific customs—these and other spe-

cial subjects are presented and illustrated in an interesting fashion.

A. A. TENNEY

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE ninth number of Volume 1 of the *Proceedings of the National Academy of Sciences* contains the following articles:

1. *The Indian and Nature*: ALICE C. FLETCHER, Peabody Museum, Harvard University.

Glimpses are given of the line the Indian pursues in his endeavor to express his view of nature and of the relation he believes to exist between its various forms and forces and himself.

2. *The Mechanism of Antagonistic Salt Action*: JACQUES LOEB, Rockefeller Institute for Medical Research, New York.

The author studies the effect of the concentration  $C_{III}$  of the salt at the external surface of membranes in addition to the concentrations  $C_I$  and  $C_{II}$  of the salt outside and inside the membrane and finds that  $C_{III}$  is serviceable in explaining the mechanism of antagonistic salt action in certain cases.

3. *The Nitrogen Problem in Arid Soils*: CHAS. B. LIPMAN, College of Agriculture, University of California.

A summary of some recent investigations and field manifestations with reference to their bearing on problems of soil fertility in California.

4. *A Notation for Use in the Discussion of Star Colors*: FREDERICK H. SEARES, Mount Wilson Solar Observatory, Carnegie Institution of Washington.

The extension of absolute scales of photographic and photovisual magnitudes to the fainter stars provides a method of determining the colors of objects at present beyond the reach of spectroscopic investigation and it is convenient in the statistical discussion of such color results to introduce a notation similar to that used for spectral classification. The letters *b*, *a*, *f*, *g*, etc., are used to correspond to *B*, *A*, *F*, *G*, etc.